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purifying said second gas to generate a third gas; and thereafter introducing said third gas into said reactor along with said vapor-phase chemicals including said first gas into said reactor with sufficient supplied energy to cause a second reaction in said reactor.

*OB*

2. The process of Claim 1, wherein said reaction comprises depositing a thin film layer on a substrate positioned in said reactor.

*OB*

3. (Amended) The process of Claim 1, wherein said first gas comprises pure H<sub>2</sub>.

*MB1 crossed*

4. (Amended) The process of Claim 1, wherein said second gas comprises non-purified H<sub>2</sub>.

*MB1 crossed*

5. (Amended) The process of Claim 1, wherein said third gas comprises between about 80% to 90% of the quantity of said pure H<sub>2</sub> introduced in said reactor.

6. The process of Claim 1, wherein the sufficient supplied energy comprises an RF low frequency power energy level of between about 0.318 watt/cm<sup>2</sup> to about 3.18 watts/cm<sup>2</sup>.

7. The process of Claim 1, wherein said reactor comprises a tapered outer shell surrounding a tapered susceptor.

Please add new Claims 16-28.

*OB*

16. (New) The process of Claim 1, wherein said third gas comprises purified H<sub>2</sub>.

*OB*

17. (New) A process for recycling a vapor-phase chemical comprising: introducing vapor-phase chemicals into a reactor with sufficient supplied energy to cause a reaction for depositing a thin film layer on a substrate positioned in said reactor; exhausting gases from said reactor resulting from said reaction; separating a first gas from said exhausted gases; purifying said first gas; and thereafter

introducing said first gas into said reactor.

18. (New) The process of Claim 17, wherein said first gas comprises H<sub>2</sub>.

19. (New) The process of Claim 17, wherein said vapor-phase chemicals comprise H<sub>2</sub>.

20. (New) The process of Claim 19, wherein said first gas comprises between about 80% to 90% of the quantity of said H<sub>2</sub> introduced in said reactor.

21. (New) The process of Claim 17, wherein the sufficient supplied energy comprises an RF low frequency power energy level of between about 0.318 watt/cm<sup>2</sup> to about 3.18 watts/cm<sup>2</sup>.

22. (New) The process of Claim 17, wherein said reactor comprises a tapered outer shell surrounding a tapered susceptor.

23. (New) The process of Claim 17, wherein said vapor-phase chemicals comprise gases selected from the group consisting of NH<sub>3</sub>, N<sub>2</sub>O, SiF<sub>4</sub>, SiH<sub>4</sub>, TiCl<sub>4</sub>, N<sub>2</sub>, Ar, HCl, and SiCl<sub>4</sub>.

24. (New) A process for recycling a by-product of a chemical reaction comprising:

introducing vapor-phase chemicals including first use hydrogen into a reactor with sufficient supplied energy to cause a first reaction for depositing a thin film layer on a substrate positioned in said reactor;

moving said second use hydrogen through a filter to convert said second use hydrogen to processing quality hydrogen; and thereafter

introducing said processing quality hydrogen into said reactor with said vapor-phase chemicals to be used in a second reaction for depositing a thin film layer on a substrate positioned in said reactor.

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